Please amend Claims 12 and 13 as follows:

12. (Amended Once) A process for making a thermally-inhibited, non-pregelatinized granular starch [comprising] which comprises the steps of:

(a) dehydrating the non-pregelatinized granular starch to substantially anhydrous[,] or anhydrous; and

(b) while maintaining the dehydrated, non-pregelatinized granular starch substantially anhydrous or anhydrous, heat treating [the substantially anhydrous starch] at a temperature of 100°C or greater for a period of time [effective] sufficient to inhibit the starch.

13. (Amended once). A process for making a thermally-inhibited, non-pregelatinized granular starch [comprising] which comprises the steps of:

(a) raising the pH of the non-pregelatinized granular starch to neutral or greater[, ];

(b) dehydrating the pH-adjusted, non-pregelatinized granular starch to substantially anhydrous[, and] or anhydrous; and

(b) while maintaining the dehydrated, non-pregelatinized granular starch substantially anhydrous or anhydrous, heat treating [the substantially anhydrous starch] at a temperature of 100°C or greater for a period of time [effective] sufficient to inhibit the starch.

A. Amendments

The claims have been amended to more particularly point out the invention by clarifying that the dehydrated starch is maintained in the substantially anhydrous or

anhydrous state during the subsequent heat treating step. See the discussion at page 9, lines 9-16 where it is made clear that the heating apparatus should be fitted with a vent so moisture does not accumulate and preferably have a means for removing the water vapor such as a vacuum or blower. Support for the term "anhydrous" may be found at page 4, line 8.

No new matter is presented.

B. Restriction Requirement

The Examiner is thanked for the withdrawal of the restriction requirement between the claims of Groups II and III.

C. Double Patenting Rejection

Claims 12-17 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting over Claims 1-21 of copending application Serial No. 08/473,688. Although the conflicting claims are not identical, the Examiner believes they are not patentably distinct.

If the claims of this application are allowed, a terminal disclaimer will be filed in the second allowed application or this application will be abandoned in favor of the '688 application.

D. §103 Rejections

Claims 12-17 are rejected under 35 U.S.C. §103 as obvious over Wurzburg et al. (U.S. Patent No. 3, 977, 897) and Applicants' admitted art.

Wurzburg et. al. teach a process for preparing a non-chemically inhibited starch by controlled heating at a pH of from about 3 to 9 of an aqueous suspension comprising a starch in intact granular form and an inorganic salt at temperatures of up to 100°C for up to 30 hours (see col. 3, lines 63-64 and col. 4, lines 5-20). This temperature range is lower than the claimed range. The Examiner notes, however, that Wurzburg et al. teach that "shorter heating periods may be used at higher temperatures" to provide a greater degree of inhibition (col. 4, lines 12-15). Following inhibition, the starch is washed to remove the salt and recovered by any conventional means, air drying, belt drying, flash drying, or spray drying (col. 4, lines 21-27).

From this teaching, the Examiner concludes that it would be obvious to one skilled in the art at the time the invention was made to adjust the temperature and time to read upon Applicants' claim limitations in order to provide the desired inhibited starch.

The Examiner notes that Wurzburg et al. fail to disclose the order of the operative steps recited in Claims 12 and 13. The Examiner, however, believes that it would have been obvious to reverse the steps of Wurzburg et al. since it has been held that reversing the order of steps in a process does not impart patentability when no unexpected result is obtained. In support the Examiner has cited Ex parte Rubin 128 U.S.P.Q. 440 (POBA 1959) and Cohn et al. v. Commissioner of Patents 148 U.S.P.Q. 486 (DC DC 1966).

The Examiner also notes that Wurzburg et al. do not employ a fluidized bed reactor to dehydrate and heat treat the starch as recited in Claim 17. Since Wurzburg et al. disclose that the drying step is performed by any known means, the Examiner believes it

would have been obvious to select any known drying apparatus to dry the Wurzburg et al. starch product.

E. Applicants' Position

The Wurzburg et al. process and Applicants' process are completely different. In Applicants' process one is heat treating a substantially anhydrous or anhydrous granular starch. Optionally, but preferably, the pH is adjusted to a neutral or alkaline pH. In the Wurzburg et al. process one is heating a water-swollen granular starch in the presence of selected salts which inhibit swelling and raise the gelatinization temperature, washing to remove the salt, and then drying. Heat treating a water-swollen granular starch is clearly not the same as heat treating a dehydrated substantially anhydrous or anhydrous starch.

As the Examiner is aware, starch exposed to the atmosphere establishes a moisture equilibrium with the moisture in the air, sorbing or desorbing moisture depending on the temperature and relative humidity. See Table 22.2 from Chapter 22: "Starch and Its Modifications" in the Handbook of Water-Soluble Gums and Resins. Under normal atmospheric conditions most commercial starches contain 10 to 17% moisture. In contrast, Applicants' substantially anhydrous starches contain "less than 1% moisture" (see page 3, line 25). When commercial starches which contain moisture are subjected to heat in the presence of water, acid hydrolysis or degradation of the starch can occur. As is pointed out at page 5, lines 21-23, this hydrolysis will retard inhibition.

It is respectfully pointed out that the Wurzburg et al. starches are annealed starches. "Annealing" involves slurrying a granular starch with excess water at temperatures below the starch's gelatinization temperature. In contrast, "heat moisture-treatments" involve

semi-dry treatments of a granular starch or flour at temperatures below the starch's gelatinization temperature, with no added moisture and with the only moisture being that normally present in the starch granule which, as is discussed above, is typically 10% or more.

In the Wurzburg et al. annealing process the starch which is heated is a suspension of a water-swollen granular starch. The heating is carried out in the presence of selected salts which inhibit swelling, raise the gelatinization temperature of the starch, and prevent the rupturing of the starch granule. See the following discussion at Column 3, lines 28-33:

> The presence of the salt in the aqueous suspension of ungelatinized starch raises the gelatinization temperature of the starch so that the suspension may be heated to high temperatures without causing the starch granules to swell and rupture yielding a gelatinized product. (emphasis added)

See the additional discussion at Column 3, lines 58-60:

> On the other hand, the presence of the salt raises the gelatinization temperature, and hence permits a high holding temperature which quickens the inhibition process. (Emphasis added.)

In contrast to Wurzburg's annealing, Applicants are heat treating a dehydrated starch which is anhydrous or substantially anhydrous (<1% moisture) and is maintained in the anhydrous or substantially anhydrous state during this heat treating. Applicants have taught that the dehydrating and heat treating apparatus can be any industrial ovens "provided that the apparatus is fitted with a vent to the atmosphere so that moisture does not accumulate and precipitate on to the starch" (see page 9, lines 9-14). Applicants have taught that it is preferable to have a means for removing the water vapor "such as, a vacuum or a blower to

sweep air from the head space of the apparatus, or a fluidizing gas" (see page 9, lines 14-16).

Applicants are not merely reversing the steps of Wurzburg et al. Even if Applicants were reversing the steps, the process would not be obvious unless the prior art suggested this reversal. In the cases cited by the Examiner, the prior art clearly suggested there would be an advantage in the reversed sequence (see page 487 of Cohn) or there was no effort to refute the Examiner's position, with the Applicants even conceding the product was the same (see Rubin at page 441).

If one were reversing the steps of Wurzburg et al. process, it would not be an annealing process since one would start with a dry granular starch and then heat an aqueous starch suspension containing this starch in the presence of salts which inhibit swelling and gelatinization. In contrast, in Applicants' process one starts with a dehydrated substantially anhydrous or anhydrous starch (not merely a "dry to the touch" starch) and heats the dehydrated starch (not a starch suspension) without any salt.

There is no prior art suggesting dehydrating to anhydrous or substantially anhydrous or which suggests heating a dehydrated starch. Clearly, an inhibition process which heat treats starches containing less than 1 wt. % moisture is not suggested by or obvious over an inhibition process which heats a suspension of water-swollen starches in the presence of a salt. Further, the fact that Applicants' process works on all starch bases means it is inherently different from the Wurzburg et al. process which works on only amylose-containing starch bases. In addition, in Applicants' process a pH above 7 or greater is preferred, whereas in Wurzburg et al. lower pH is preferred. This difference suggests the inhibition mechanism is different in the two processes.

F. Closing

In view of the above remarks on why Applicants' process is not suggested by or obvious over Wurzburg et al., it is believed the §103 rejection is overcome.

Reconsideration and an early allowance is respectfully requested.

Respectfully submitted,

Dated: November 4, 1996

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